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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,806	07/30/2001	Stephen L. Ball	11783.0017PC	2077

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EXAMINER
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LAM, HUNG H

ART UNIT	PAPER NUMBER
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2622

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/830,806	<b>Applicant(s)</b> BALL, STEPHEN L.	
	<b>Examiner</b> Hung H. Lam	<b>Art Unit</b> 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☒ Claim(s) 24-29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Election/Restrictions*

Applicant's election with traverse of nonelected species in the reply filed on 03/06/06 is acknowledged. Applicants elect species 1 (Fig. 1-17) corresponding to claims 1-29.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6, 11-13 and 19-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Milgram (US-5,175,616).

With regarding **claim 1**, Milgram discloses an apparatus comprising

an imaging device (video signal generating system 11), a range finder (Fig. 7B; see pointers 371-372; Col. 4, Ln. 37-45; Col. 6, Ln. 47-52), and a processor and processing image and range signals to construct a three-dimensional image from said signals (Col. 3, Ln. 62- Col. 4, Ln. 29; Col. 8, Ln. 6-Col. 9, Ln. 45: Milgram teaches a resulting signal 36 delivering to display monitor 38 and spectacles 64 wherein a user is able to perceive three dimensional images; Milgram further teaches that the rang finder/pointer 371 would be perceived as hovering exactly above a corner of a rock in three dimension).

With regarding **claim 2**, Milgram discloses the apparatus wherein the imaging device comprises a camera (Fig. 1; camera 16 and 14).

With regarding **claim 3**, Milgram discloses the apparatus wherein the imaging device comprises a digital video camera (Fig. 1; video signal generating system 11; Col. 8, Ln. 10-22).

With regarding **claim 4**, Milgram discloses the apparatus wherein the imaging device is capable of zoom functions (Col. 22, Ln. 59-64; Col. 23, Ln. 12-15).

With regarding **claim 5**, Milgram discloses the apparatus wherein the apparatus includes a display device to allow a user to view a target area using the imaging device (Fig. 1; monitor 38 and stereoscopic shuttering spectacles 64).

With regarding **claim 6**, Milgram discloses the apparatus wherein the apparatus includes a pan and tilt unit for panning and tilting of the range finder and/or imaging device (Col. 5, Ln. 24-26; Col. 22, Ln. 59-64).

With regarding **claim 11**, Milgram discloses the apparatus wherein the image is digitized (Fig. 1; it is inherent that image capturing by video signal generating system 11 is digitized in order for the system to operate as disclosure).

With regarding **claim 12**, Milgram discloses the apparatus wherein the image comprises a plurality of pixels (Fig. 1; displayed images in the stereoscopic spectacles 64 and monitor 38 inherently comprise a plurality of pixels).

With regarding **claim 13**, Milgram discloses the apparatus wherein the image comprises a captured image (see Figs. 7A and 8A; Col. 8, Ln. 27-66).

With regarding **claim 19**, Milgram discloses the apparatus wherein the apparatus is operated by remote control (Col. 1, Ln. 13-47; Col. 4, Ln. 10-13; Col. 5, Ln. 14-26).

With regarding **claim 20**, Milgram discloses the apparatus wherein the apparatus is controlled by an input device (Fig. 1; positioning device 35; Col. 8, Ln. 27-34; Col. 9, Ln. 25-30).

With regarding **claim 21**, Milgram discloses the apparatus wherein the input device facilitates operation of a particular function of the apparatus (Fig. 1; positioning device 35; Col. 8, Ln. 27-34; Col. 9, Ln. 25-30).

With regarding **claim 22**, Milgram discloses a method of generating a three-dimensional image of a target area (Col. 3, Ln.62- Col. 4, Ln. 29; Col. 8, Ln. 6-34), the method comprising the steps of providing an imaging device (video signal generating system 11), providing a range finder (Fig. 7B; see pointers 371-372; Col. 4, Ln. 37-45; Col. 6, Ln. 47-52), operating the imaging device to provide an image of the target area (Col. 8, Ln. 46-66: camera 14 and 16 provide target images in a video monitor 38; see Figs. 7B and 8B), and subsequently measuring the distance to each of a plurality of points by scanning the range finder at preset intervals relating to the points (Col. 8, Ln. 40-66; Col. 9, Ln. 24-Col. 10, Ln. 10: Milgram teaches a plurality of points that are pointed and measured by pointer 371, 372,383-387 in Figs. 7B and 8B respectively; Col. 24, Ln. 67).

With regarding **claim 23**, Milgram discloses a method according to claim 22, wherein the method includes the further steps of:

obtaining a focal length of the camera (Col. 5, Ln. 44-52; Col. 14, Ln. 8);

obtaining a field of view of the camera (field of view of the camera are interpreted as any captured images in Figs. 7A and 7B that are display on monitor 38 or stereoscopic spectacles 64 of Fig. 1); and

obtaining a principal distance of the camera (Col. 24, Ln. 64-Col. 25, Ln. 12: Milgram teaches a calculation wherein distance from camera to object is calculated).

4. Claims 1, 14, 15 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Kacyra (US-6,330,523).

With regarding **claim 1**, Kacyra discloses an apparatus comprising  
an imaging device (Fig. 8-8A; receiver 610 and scanner 504), a range finder (Fig. 7B; see laser and beam expander 602 and 606), and a processor and processing image and range signals to construct a three-dimensional image from said signals (Col. 3, Ln. 40-45; Col. 5, Ln. 36-48; Col. 13, Ln. 64-37; Col. 15, Ln. 25-48; Col. 20, Ln. 28-33).

With regarding **claim 14**, Kacyra discloses the apparatus wherein the range finder comprises a laser range finder (Fig. 8-8A; laser 602 and beam expander 606).

With regarding **claim 15**, Kacyra discloses the apparatus wherein the range finder is bore-sighted with the imaging device (Fig. 8-8A; it is inherent that optical axis of laser beam of laser unit 602 and scanner/receiver 610/504 are bore-sighted).

With regarding **claim 22**, Kacyra discloses a method of generating a three-dimensional image of a target area (abstract), the method comprising the steps of providing an imaging device (Fig. 8-8A; receiver 610 or scanner 504), providing a range finder (Fig. 7B; see laser and beam

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expander 602 and 606), operating the imaging device to provide an image of the target area (see point cloud image 30 in Fig. 1), and subsequently measuring the distance to each of a plurality of points by scanning the range finder at preset intervals relating to the points (Fig. 1; point cloud image 30; Col. 3, Ln. 40-45; Col. 5, Ln. 36-48; Col. 13, Ln. 64-37; Col. 15, Ln. 25-48; Col. 20, Ln. 28-33).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milgram.

With regarding **claim 7**, Milgram teaches motors 55 and 55' for panning and tilting camera 16 and 14 (Col. 5, Ln. 67-Col. 6, Ln. 11; Col. 13, Ln. 29-52). However, Milgram fails to explicitly disclose the apparatus wherein the pan and tilt unit comprises a first motor for panning of the range finder and/or imaging device, and a second motor for tilting of the range finder and/or imaging device.

Official Notice is taken that it is well known and expected in the art to use a first motor for panning and a second motor for tilting an imaging device in order to independently drive the



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cameras in horizontal and vertical direction. Therefore, it would have been obvious to one of ordinary skill in the art to modify the device of Milgram to include a first and second motors in order to pan and tilt independently.

With regarding **claim 8**, Milgram discloses the apparatus wherein the first and second motors are controlled by the processor (Fig. 1; see control computer 32 and alignment controller 52; Col. 13, Ln. 29-40).

7. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milgram in view of Iijima (US-6,839,081).

With regarding **claim 9**, Milgram teaches a panning/tilting function of a camera and calculation of convergent angle of the panning function (Col. 5, Ln. 20-25; Col. 14, Ln. 15-65). However, Milgram fails to explicitly disclose the apparatus according to claim 6, wherein the pan and tilt unit includes a first and second digital encoders for measuring the angles of pan and tilt respectively.

In the same field of endeavor, Iijima teaches a single image sensing system for reproducing a three or two-dimensional images (Col. 1, 6-11). Iijima further teaches a pair of convergence angle encoders (26L and 26R) that are fed into a total system control unit (21) for detecting convergence angles (Col. 7, Ln. 1-4). In light of the teaching from Iijima, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Milgram to include a pair of convergence angle encoders as taught by

Iijima in order to detect convergence angles. The modifications thus provide feed-back-control signals for enhancing accuracy of camera movements.

With regarding **claim 10**, Milgram in view of Iijima discloses the apparatus wherein the outputs of the first and second encoders are fed to the processor (Iijima: see Fig. 4; convergence angle encoder 26R-26L and total control unit 21).

8. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milgram in view of Diefes (US-5,446,465).

With regarding claim 16, Milgram fails to disclose the apparatus wherein the apparatus includes a compass and an inclinometer and/or gyroscope.

In the same field of endeavor, Diefes teaches a portable device comprising GPS for determining the position of the device (Fig. 1; GPS antenna 12-14; Col. 4, Ln. 11-27; Col. 6, Ln. 39-56), inclinometer for determining the elevation of angle of a system (Fig. 1; inclinometer 22; Col. 7, Ln. 40-50) and a compass pointing ring on a display (Figs. 6a-6b; Col. 17, Ln. 56- Col. 18-Ln.23). Diefes further teaches that the portable device improve camera pointing and photogrammetry as well as positioning and surveying functions (Col. 19, Ln. 30-35). In light of the teaching from Diefes, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Milgram to include a GPS, compass, inclinometer as taught by Diefes in order to improve a camera's pointing, positioning and surveying functions (Diefes: Col. 19, Ln. 30-35).

With regarding claim 17, Milgram fails to disclose the apparatus according to claim 1, wherein the apparatus further includes a position fixing system for identifying the geographical position of the apparatus.

In the same field of endeavor, Diefes teaches a portable device comprising GPS for determining the position of the device (Fig. 1; GPS antenna 12-14; Col. 4, Ln. 11-27; Col. 6, Ln. 39-56), inclinometer for determining the elevation of angle of a system (Fig. 1; inclinometer 22; Col. 7, Ln. 40-50) and a compass pointing ring on a display (Figs. 6a-6b; Col. 17, Ln. 56- Col. 18-Ln.23). Diefes further teaches that the portable device improve camera pointing and photogrammetry as well as positioning and surveying functions (Col. 19, Ln. 30-35). In light of the teaching from Diefes, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Milgram to include a GPS, compass, inclinometer as taught by Diefes in order to improve a camera's pointing, positioning and surveying functions (Diefes: Col. 19, Ln. 30-35).

With regarding **claim 18**, Milgram in view of Diefes discloses the apparatus according to claim 17, wherein the position fixing system is a Global Positioning System (Diefes: Fig. 1; GPS antenna 12-14; Col. 4, Ln. 11-27; Col. 6, Ln. 39-56).

#### *Allowable Subject Matter*

9. Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 24 the following is a statement of reason for the indication of allowance:  
the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest the method of claim 22 or claim 23 further in combination with:  
**wherein the method includes the further steps of digitizing the image to provide a plurality of pixels within the digital image;**

**calculating horizontal and vertical angles between a reference point in the image and each pixel;**

**moving the range finder through the horizontal and vertical angles whereby the range finder is directed at each pixel in sequence; and**

**actuating the range finder to obtain a range to the target corresponding to the position of the pixel.**

Regarding claims 25-29, the claims are objected as being dependent of claims 24.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Kozah (US-5,337,149) discloses a computerized three-dimensional data acquisition apparatus having laser range finder.

b) Ohtomo (US-2005-0,275,830) discloses a surveying apparatus with range finder for measuring distances.

c) Onoguchi (US-5,694,483) discloses a measurement face extraction apparatus for measuring road area in three dimensions.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung H. Lam whose telephone number is 571-272-7367. The examiner can normally be reached on Monday - Friday 8AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NGOC YEN VU can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HL

05/25/06

  
NGOC-YEN VU  
SUPERVISORY PATENT EXAMINER